

What is claimed is:

1. A method of manufacturing a nonvolatile semiconductor storage device, comprising:

the first step of successively forming a first insulating film and a first polysilicon layer on a semiconductor substrate, and implanting nitrogen ions into a front surface of the first polysilicon layer;

the second step of patterning the first polysilicon layer and the first insulating film into the shape of a band;

the third step of thermally oxidizing the patterned band-shaped first polysilicon layer, thereby to form a second insulating film which is thicker at side surfaces of the first polysilicon layer than at the front surface thereof;

the fourth step of forming a second polysilicon layer on a front surface of the resulting semiconductor substrate formed with the second insulating film; and

the fifth step of performing patterning so as to form each storage element of the nonvolatile semiconductor storage device as includes the first insulating film, a floating gate electrode made of the first polysilicon layer, the second insulating film, and a control gate electrode made of the second polysilicon layer.

2. A method of manufacturing a nonvolatile semiconductor storage device, comprising:

the first step of successively forming a first

insulating film and a first polysilicon layer on a semiconductor substrate, and patterning the first polysilicon layer and the first insulating film into the shape of a band;

the second step of implanting nitrogen ions into a front surface of the first polysilicon layer;

the third step of thermally oxidizing the first polysilicon layer implanted with the nitrogen ions, thereby to form a second insulating film which is thicker at side surfaces of the first polysilicon layer than at the front surface thereof;

the fourth step of forming a second polysilicon layer on a front surface of the resulting semiconductor substrate formed with the second insulating film; and

the fifth step of performing patterning so as to form each storage element of the nonvolatile semiconductor storage device as includes the first insulating film, a floating gate electrode made of the first polysilicon layer, the second insulating film, and a control gate electrode made of the second polysilicon layer.

3. A method of manufacturing a nonvolatile semiconductor storage device, comprising:

the first step of successively forming a first insulating film, a first polysilicon layer and a silicon nitride film on a semiconductor substrate, and patterning the silicon nitride film, the first polysilicon layer and the first

insulating film into the shape of a band;

the second step of thermally oxidizing the first polysilicon layer patterned into the band shape, thereby to form oxide films at side surfaces of the first polysilicon layer;

the third step of removing the silicon nitride film and the oxide films;

the fourth step of thermally oxidizing the first polysilicon layer, thereby to form a second insulating film which covers the first polysilicon layer;

the fifth step of forming a second polysilicon layer on a front surface of the resulting semiconductor substrate formed with the second insulating film; and

the sixth step of performing patterning so as to form each storage element of the nonvolatile semiconductor storage device as includes the first insulating film, a floating gate electrode made of the first polysilicon layer, the second insulating film, and a control gate electrode made of the second polysilicon layer.

4. A method of manufacturing a nonvolatile semiconductor storage device as defined in claim 3, wherein after the first polysilicon layer has been formed on the semiconductor substrate through the first insulating film at said first step, nitrogen ions are implanted into a front surface of the first polysilicon layer, and the silicon nitride

film is subsequently formed on the front surface of the first polysilicon layer.